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IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MONTANA
BILLINGS DIVISION

UNITED STATES FIDELITY &
GUARANTY COMPANY,

Plaintiff,

and

Cause No. CV-04-29-BLG-RFC

CONTINENTAL INSURANCE COMPANY,

Plaintiff Intervenor,

vs.

SOCO WEST, INC., BRILLIANT
NATIONAL SERVICES, INC.,
STINNES CORPORATION, and
BRENNTAG (HOLDING) N.V.,
Defendants.

COPY

The Deposition of BRUCE E. DALE, Ph.D.,
Taken at 120 North Washington Square,
Lansing, Michigan,
Commencing at 9:05 a.m.,
Tuesday, December 13, 2005,
Before Kelli L. Werner, CSR-6610, RPR.

Pat Carl & Associates (763) 591-0535 or (800) 591-9PCA (722)

DEFENDANTS' 3/23/06 MOTION IN LIMINE # 3

ATTACHMENT I

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|---|---|
| <p>1 If you need a break at any time, just ask</p> <p>2 and I will accommodate you. Before we take a break I</p> <p>3 will ask that you just answer the question if there is</p> <p>4 one pending before we break.</p> <p>5 A. Fine.</p> <p>6 MR. LYNCH: And, for the record, there is</p> <p>7 an agreement among counsel in this case that we will</p> <p>8 not be asking questions about drafts of opinions or</p> <p>9 communications with counsel. Is that --</p> <p>10 MR. DAVIS: Right.</p> <p>11 MR. GROSSBART: Right. I would like to</p> <p>12 reflect the stipulation we discussed before the start</p> <p>13 of the deposition that an objection by any lawyer on</p> <p>14 this side of the table will count as the objection of</p> <p>15 the other. So the objections, I should say, on behalf</p> <p>16 of any plaintiff or intervening plaintiff is the</p> <p>17 objection of the other.</p> <p>18 MR. LYNCH: Yes. We have agreed to that.</p> <p>19 MARKED BY THE REPORTER:</p> <p>20 DEPOSITION EXHIBIT NUMBER 2000</p> <p>21 9:08 a.m.</p> <p>22 BY MR. LYNCH:</p> <p>23 Q. Mr. Dale, I have just handed you a document that's</p> <p>24 been marked as Deposition Exhibit 2000 in this matter.</p> <p>25 Is that a copy of the expert report you filed on</p> | <p>1 preparing -- submitting this report?</p> <p>2 A. Yes.</p> <p>3 Q. Why hadn't you done this work prior to submitting the</p> <p>4 report?</p> <p>5 A. Just didn't have the time. I thought about it later.</p> <p>6 Q. Other than the calculations involving the evaporation</p> <p>7 of perchloroethylene, have you formed any opinions</p> <p>8 that you expect to testify about at trial or in any</p> <p>9 affidavits that are not contained in this report?</p> <p>10 A. No.</p> <p>11 Q. If you look at the report, I notice that there are</p> <p>12 numerous documents cited in the footnotes of the</p> <p>13 report. In connection with forming the opinions that</p> <p>14 are set forth in this report did you consider or</p> <p>15 review any documents that are not identified in the</p> <p>16 report?</p> <p>17 A. Yes.</p> <p>18 Q. You did?</p> <p>19 A. Yes.</p> <p>20 Q. So it's accurate to say that this report does not</p> <p>21 identify all the materials you considered in</p> <p>22 connection with forming your opinions?</p> <p>23 A. That's correct.</p> <p>24 Q. Why didn't you list out the materials you considered</p> <p>25 in connection with forming your opinions in the</p> |
| Page 7 | Page 9 |
| <p>1 behalf of the plaintiffs?</p> <p>2 MR. DAVIS: I will object to the term</p> <p>3 filed.</p> <p>4 BY MR. LYNCH:</p> <p>5 Q. You prepared on behalf of the plaintiffs.</p> <p>6 A. Yes.</p> <p>7 Q. Am I correct that this is a report that you offered to</p> <p>8 rebut the expert report that was prepared by one of</p> <p>9 the experts that the defendants retained -- Dr. Robert</p> <p>10 Harris?</p> <p>11 A. Yes.</p> <p>12 Q. Does this report contain a complete statement of all</p> <p>13 the opinions that you expect to testify at the trial</p> <p>14 of this case and the basis for those opinions?</p> <p>15 A. Yes.</p> <p>16 MR. DAVIS: Let me interject. Without</p> <p>17 going into our discussions yesterday, Dr. Dale</p> <p>18 subsequent to issuing his report did do about two</p> <p>19 sheets of calculations to supplement -- I guess would</p> <p>20 be the correct term --</p> <p>21 THE WITNESS: It reflects the evaporation</p> <p>22 rate which I testified in my report that perc</p> <p>23 evaporates very rapidly.</p> <p>24 BY MR. LYNCH:</p> <p>25 Q. That's work you prepared after filing or after</p> | <p>1 report?</p> <p>2 A. They weren't relevant, didn't impact my opinions.</p> <p>3 Q. What additional documents other than those that are</p> <p>4 identified in this report did you consider?</p> <p>5 A. We sent approximately two boxes of documents that</p> <p>6 contained site investigation reports, hydrogeology</p> <p>7 types of things. I can't tell you in detail what they</p> <p>8 are. There are several boxes.</p> <p>9 Q. Anything else other than site investigation reports?</p> <p>10 A. I believe there were a couple of depositions that I</p> <p>11 didn't find anything relevant in.</p> <p>12 Q. Do you recall whose depositions those were?</p> <p>13 A. No, I can't.</p> <p>14 Q. Other than site investigation reports and a couple of</p> <p>15 deposition transcripts do you recall any documents</p> <p>16 that you considered in connection with forming your</p> <p>17 report that are not identified in the report?</p> <p>18 A. Not that I recall.</p> <p>19 MR. LYNCH: At this point I just want to go</p> <p>20 on the record that pursuant to Rule 26 the expert is</p> <p>21 required to identify all documents they consider in</p> <p>22 connection with providing their expert report. We're</p> <p>23 going to object to that not having been done in this</p> <p>24 report and hold the deposition open pending our</p> <p>25 receipt of a complete list of those documents.</p> |

3 (Pages 6 to 9)

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1 MR. DAVIS: Well, put it on the record.
 2 Your objection is noted.
 3 MR. GROSSBART: I'm not sure that's an
 4 exact correct statement of what an expert is supposed
 5 to do in light of the foundation testimony you
 6 elicited.
 7 MR. DAVIS: On that note I think -- I'm not
 8 sure what you are referencing in terms of what's
 9 listed in this report. He obviously footnoted many
 10 documents that are part of the file which he did rely
 11 on and formed the basis of his opinion.
 12 MR. LYNCH: I understand that. He just
 13 testified he did consider additional documents in
 14 forming his opinion. I don't have it in front of me,
 15 but I think the rule says considered.
 16 MR. GROSSBART: I think he says he looked
 17 at other documents and decided they were not relevant
 18 to his opinion and, therefore, that is why they are
 19 not listed. He could have listed the Detroit Free
 20 Press, too. That probably wouldn't have been relevant
 21 to his opinion.
 22 BY MR. LYNCH:
 23 Q. Did you consider additional documents in connection
 24 with forming your opinion that are not listed in your
 25 report?

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1 A. I read or scanned additional documents that are not
 2 referenced here. None of them impacted my opinion.
 3 Q. I see that you have brought several file folders'
 4 worth of documents with you today. Could you tell me
 5 what those documents are?
 6 A. They are depositions, record of decision,
 7 correspondence. They are essentially everything
 8 that's footnoted here -- referred to in the footnotes.
 9 Q. Any of these documents not identified in the footnotes
 10 of your report?
 11 A. I don't believe so.
 12 Q. And maybe at a break we can just confirm that or not.
 13 That's what we can do.
 14 Since filing your expert report have you
 15 reviewed or considered any additional documents
 16 relating to your opinion?
 17 A. Yes.
 18 Q. What documents are those?
 19 A. It's the document that underlies the calculation that
 20 I did. It's this document.
 21 MR. LYNCH: Can we mark this? Do we need
 22 to make a copy first?
 23 MR. DAVIS: Probably need to make a copy.
 24 MR. LYNCH: Let's take a quick break and
 25 we'll make a copy.

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1 (Off the record at 9:17 a.m.)
 2 (Back on the record at 9:26 a.m.)
 3 MARKED BY THE REPORTER:
 4 DEPOSITION EXHIBIT NUMBERS 2001-2004
 5 9:26 a.m.
 6 BY MR. LYNCH:
 7 Q. Mr. Dale, you have in front of you the additional
 8 documents that have been marked as exhibits in this
 9 matter -- Exhibits 2001, 2002, 2003, 2004.
 10 Am I correct that these are the documents
 11 you relied on subsequent to submitting your expert
 12 report in this matter to reach a conclusion as to the
 13 evaporation rates of perchloroethylene?
 14 A. Yes.
 15 Q. If we look at Exhibit 2004, could you identify that
 16 document for me?
 17 A. These are calculations I did regarding the rate of
 18 evaporation of perchloroethylene.
 19 Q. What are the assumptions that you have made in
 20 connection with these calculations?
 21 A. The assumption is a spill -- instantaneous spill on
 22 level concrete of 250 gallons of perc. The ground
 23 temperature is assumed to be 77 degrees Fahrenheit
 24 which is the air temperature.
 25 Q. I'm sorry. What was the temperature?

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1 A. 77 degrees Fahrenheit. And a wind speed of
 2 approximately -- I think it was 9.1 miles per hour.
 3 Q. If you look at your report, can you identify the
 4 portion of the report that these calculations pertain
 5 to, if any?
 6 A. Yes. It's opinion B(a). Also I would say B(c).
 7 Q. And opinion B(a) says, perc evaporates much more
 8 rapidly than it permeates intact concrete. Under
 9 conditions favoring maximum permeation of perc it will
 10 still evaporate about 1000 times more rapidly than it
 11 will permeate concrete.
 12 Did I read that correctly?
 13 A. Yes.
 14 Q. Can you explain how these calculations relate to that
 15 opinion?
 16 A. Well, it's a calculation of the evaporation rate of
 17 perc. This perc will evaporate -- a 250-gallon spill
 18 of perc under these conditions will evaporate in less
 19 than 20 minutes. See page 3-3.
 20 Q. So under these conditions it's your conclusion that a
 21 250-gallon spill of perc would completely evaporate in
 22 20 minutes?
 23 A. Yes.
 24 Q. Would there be any residue left on the concrete?
 25 A. No.

4 (Pages 10 to 13)

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|---|---|
| <p>1 opinion?</p> <p>2 A. Yes.</p> <p>3 Q. Am I correct that you identify in that paragraph two</p> <p>4 bases for that opinion? First, such a large spill of</p> <p>5 perc would have damaged or discolored a large area of</p> <p>6 asphalt; second, such a large spill of perc would have</p> <p>7 produced a strong odor over a large area and would</p> <p>8 almost certainly have been noted by Dyce employees or</p> <p>9 Dyce neighbors.</p> <p>10 A. That's correct.</p> <p>11 Q. Anywhere in that paragraph do you discuss the distance</p> <p>12 that the perc would have to travel being a relevant</p> <p>13 factor as to why it is highly unlikely that such a</p> <p>14 perc spill actually occurred?</p> <p>15 A. No.</p> <p>16 Q. So that's a new opinion you formed?</p> <p>17 A. No, it's not.</p> <p>18 Q. Where is that opinion expressed in your expert report?</p> <p>19 A. It's the evaporation rate of perc in B(a).</p> <p>20 Q. B(a) states, perc evaporates much more rapidly than it</p> <p>21 permeates intact concrete. Under conditions favoring</p> <p>22 maximum permeation of perc, it will still evaporate</p> <p>23 about 1000 times more rapidly than it will permeate</p> <p>24 concrete.</p> <p>25 A. And B(b).</p> | <p>1 A. It does not.</p> <p>2 Q. Do you intend to testify as to that fact at trial or</p> <p>3 that opinion at trial?</p> <p>4 A. If I'm asked.</p> <p>5 Q. But you would agree that your report does not contain</p> <p>6 a statement as to that opinion?</p> <p>7 MR. GROSSBART: Objection to the form of</p> <p>8 the question.</p> <p>9 MR. DAVIS: That mischaracterizes his</p> <p>10 testimony and it's argumentative at this point.</p> <p>11 A. It certainly mischaracterizes my testimony.</p> <p>12 BY MR. LYNCH:</p> <p>13 Q. This photograph, in your opinion, supports that</p> <p>14 testimony?</p> <p>15 A. Supports what testimony?</p> <p>16 Q. Supports your --</p> <p>17 MR. DAVIS: Supports his --</p> <p>18 BY MR. LYNCH:</p> <p>19 Q. Supports your opinion as to the likelihood of a perc</p> <p>20 spill in the loading/unloading area resulting in</p> <p>21 contamination in the northwest corner.</p> <p>22 A. That's correct.</p> <p>23 Q. Showing you a compilation of additional documents that</p> <p>24 you brought with you here today. Can you identify</p> <p>25 those documents?</p> |
| Page 35 | Page 37 |
| <p>1 Q. And that discusses -- perc is a good solvent for</p> <p>2 hydrocarbon compounds such as asphalt and will</p> <p>3 dissolve the hydrocarbon portion of asphalt. If</p> <p>4 spilled on asphalt, perc would dissolve some of the</p> <p>5 asphalt and then would slowly evaporate from the</p> <p>6 resulting asphalt/perc mixture.</p> <p>7 Where in either of those paragraphs do you</p> <p>8 mention the distance that the perc would have to</p> <p>9 travel?</p> <p>10 A. I do not.</p> <p>11 Q. If it's your opinion that that is a basis for</p> <p>12 rebutting Dr. Harris's opinion as to how the</p> <p>13 contamination got to the northwest corner why isn't</p> <p>14 that in your report?</p> <p>15 A. I disagree with your characterization of my testimony.</p> <p>16 Q. How so?</p> <p>17 A. I testified now a number of times that perc evaporates</p> <p>18 very, very rapidly.</p> <p>19 Q. Mm-hmm.</p> <p>20 A. A perc spill does not magically travel 350 feet</p> <p>21 without evaporating at the same time. It just does</p> <p>22 not happen. It's physically impossible.</p> <p>23 Q. Where is that statement contained in your expert</p> <p>24 report that a perc spill cannot travel 350 feet</p> <p>25 without evaporating?</p> | <p>1 A. These are summaries of contamination of soil and</p> <p>2 groundwater at different places or points on the Dyce</p> <p>3 property.</p> <p>4 Q. Okay. Did you consider those documents in connection</p> <p>5 with forming the expert report set forth in your</p> <p>6 report?</p> <p>7 A. I considered them. They did not impact my opinions.</p> <p>8 Q. Those documents that you're looking at, is it true</p> <p>9 that they contain information showing where the</p> <p>10 various sampling locations were taken from at the Dyce</p> <p>11 site and also contained information showing what the</p> <p>12 amounts of contamination, if any, were at each of the</p> <p>13 samples?</p> <p>14 A. That's correct.</p> <p>15 Q. Is that information that you considered in connection</p> <p>16 with forming the opinions expressed in your report?</p> <p>17 A. I just answered yes, that I considered it.</p> <p>18 Q. But the -- are you saying -- is it your testimony that</p> <p>19 the location of the samples on the Dyce site and the</p> <p>20 amount of contamination found in the samples, that</p> <p>21 information had no impact on the opinions expressed in</p> <p>22 your expert report?</p> <p>23 A. I don't understand your question.</p> <p>24 Q. In your report you discuss potential sources for</p> <p>25 contamination found at the Dyce facility near</p> |

10 (Pages 34 to 37)

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|--|--|
| <p>1 Billings, Montana. Is that correct?</p> <p>2 A. I think that mischaracterizes my testimony. I</p> <p>3 identify ways -- a number of ways in which perc was</p> <p>4 routinely released, spilled, cleaned from equipment at</p> <p>5 the facility.</p> <p>6 Q. In part C of your report -- part C(c) it states, perc</p> <p>7 that's protected from evaporation could remain for</p> <p>8 years at the bottom of ponds and could eventually</p> <p>9 permeate through concrete over long periods of time.</p> <p>10 Perc would attack and eventually dissolve most plastic</p> <p>11 liners thereby escaping to the underlying soil.</p> <p>12 A. That's correct.</p> <p>13 Q. Is it your opinion that that is the cause of the perc</p> <p>14 contamination at the Dyce site?</p> <p>15 A. That's beyond my -- I don't know.</p> <p>16 Q. You have no opinion as to the cause of the</p> <p>17 contamination at the Dyce facility?</p> <p>18 A. That's beyond the scope of my assignment here.</p> <p>19 Q. Is that correct? You do not have an opinion as to --</p> <p>20 A. That's beyond the scope of my opinion here -- beyond</p> <p>21 the scope of my assignment.</p> <p>22 Q. Do you have an opinion as to the source of any of the</p> <p>23 contamination at the Dyce facility in Billings,</p> <p>24 Montana?</p> <p>25 A. That's not my expertise. I have no opinion.</p> | <p>1 Q. What documents did you rely on to ascertain that</p> <p>2 distance?</p> <p>3 A. There are photographs of the site with a scale that I</p> <p>4 used someplace.</p> <p>5 Q. Are those documents identified in your expert report?</p> <p>6 A. I believe so.</p> <p>7 Q. Can you tell me where in your expert report those</p> <p>8 photographs -- you have your expert report in front of</p> <p>9 you. Can you tell me where in your expert report you</p> <p>10 identify those photographs?</p> <p>11 A. I don't recall.</p> <p>12 Q. Well, look through your report.</p> <p>13 A. Well, I didn't identify any photographs in my expert</p> <p>14 report.</p> <p>15 Q. Well, there are documents you relied on that are not</p> <p>16 identified in your expert report.</p> <p>17 A. You mischaracterized my testimony.</p> <p>18 Q. How so?</p> <p>19 A. Suzanne Miller's response to second EPA request for</p> <p>20 information under CERCLA I believe has that -- that</p> <p>21 kind of information. I suspect that some of the other</p> <p>22 depositions do also.</p> <p>23 The site investigation report, footnote</p> <p>24 number 23, I believe has scale information. Suzanne</p> <p>25 Miller's notarized response to the first EPA request</p> |
| Page 39 | Page 41 |
| <p>1 Q. You have no opinion on that. You won't be offering</p> <p>2 opinion on that at trial? You don't intend to offer</p> <p>3 an opinion on that at trial?</p> <p>4 A. No.</p> <p>5 Q. I'm sorry. To clarify for the record, no, you will</p> <p>6 not be testifying to that at trial?</p> <p>7 A. No. That's not my expertise. That's not what I do.</p> <p>8 Q. Okay. How did -- if they did -- the information</p> <p>9 relating to the locations of the samples and the</p> <p>10 amount of contamination found in those locations --</p> <p>11 how did that information affect any of the opinions</p> <p>12 expressed in your expert report?</p> <p>13 A. Well, apparently the largest source of contamination</p> <p>14 is that spot in the northwest corner that, again, is</p> <p>15 about 350 feet from where perc was handled on the site</p> <p>16 and where any spill of perc would probably have</p> <p>17 occurred. That's a very long distance for a spill to</p> <p>18 travel.</p> <p>19 Q. So am I correct that information relating to the</p> <p>20 location of the samples taken at the Dyce facility and</p> <p>21 the amount of contamination found in those locations</p> <p>22 is information that you considered and relied on in</p> <p>23 forming the opinions formed in your expert report?</p> <p>24 A. Well, particularly the distance from the spill</p> <p>25 location to the contamination.</p> | <p>1 under CERCLA I believe has that type of scale</p> <p>2 information.</p> <p>3 Q. Do any of those documents contain information showing</p> <p>4 where the samples were taken from or the amount of</p> <p>5 contamination that was found in those samples?</p> <p>6 A. I believe so.</p> <p>7 Q. Which ones?</p> <p>8 A. I don't recall.</p> <p>9 Q. I'm showing you another document. Is that a document</p> <p>10 -- can you identify that document?</p> <p>11 A. No, I can't. There are no Bates numbers. I'm not</p> <p>12 sure where it came from.</p> <p>13 Q. Is that a document you considered in connection with</p> <p>14 forming the opinions expressed in your expert report?</p> <p>15 A. I considered it.</p> <p>16 Q. Is any of the information in that document -- did you</p> <p>17 find it to be relevant to the opinions you expressed</p> <p>18 in your expert report?</p> <p>19 A. No.</p> <p>20 Q. Completely irrelevant?</p> <p>21 MR. GROSSBART: Objection to the form of</p> <p>22 the question. You have now gone from considered to</p> <p>23 relied to relevant. And in context I think the</p> <p>24 question is vague as to what you mean by relevant.</p> <p>25 Under Rule 26 under the federal rules of</p> |

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| <p>1 on?</p> <p>2 A. Yes.</p> <p>3 Q. Was Mr. Adams an expert witness?</p> <p>4 A. Yes.</p> <p>5 Q. Was he retained by the same counsel as you?</p> <p>6 A. I don't recall if he was or not. I don't know if he</p> <p>7 was on the opposite side or not.</p> <p>8 Q. And what testimony does Mr. Adams give that you feel</p> <p>9 supports the opinions expressed in your expert report?</p> <p>10 MR. GROSSBART: Object to the form of the</p> <p>11 question in light of his prior testimony about what he</p> <p>12 said supports his opinion or not.</p> <p>13 BY MR. LYNCH:</p> <p>14 Q. Do any statements -- let me back up.</p> <p>15 In your report you cite the deposition</p> <p>16 testimony of Franklin Agardy, correct?</p> <p>17 A. Correct.</p> <p>18 Q. Is it your belief that the deposition testimony of</p> <p>19 Mr. Adams is essentially substantively the same with</p> <p>20 respect to the information that was provided by Mr.</p> <p>21 Agardy in his deposition?</p> <p>22 A. For that particular point, yes.</p> <p>23 Q. What point is that?</p> <p>24 A. The point is the reaction of perc -- that perc will</p> <p>25 dissolve asphalt.</p> | <p>1 of the asphalt and that it could be weeks or months,</p> <p>2 could be quicker, could be longer? Would you agree</p> <p>3 with that statement?</p> <p>4 A. I think it could be any time from essentially</p> <p>5 instantaneous to fairly long depending on how much</p> <p>6 perc and what the temperature was, the things he cites</p> <p>7 here.</p> <p>8 Q. What other variables would come into play that would</p> <p>9 affect how soon perc might noticeably begin to</p> <p>10 dissolve asphalt?</p> <p>11 A. Temperature, wind speed, how much perc -- how thick</p> <p>12 the puddle of perc was, attempts to clean it up.</p> <p>13 Those are probably the major variables.</p> <p>14 Q. Would the composition of the asphalt have any effect</p> <p>15 on it?</p> <p>16 A. Very little, I would think.</p> <p>17 Q. Why do you say that?</p> <p>18 A. Asphalt composition does not vary that much.</p> <p>19 Q. Would it make a difference if the asphalt was wet or</p> <p>20 dry at the time of the spill?</p> <p>21 MR. DAVIS: Object as to the form of the</p> <p>22 question. Wet or dry with what? Do you mean water?</p> <p>23 MR. LYNCH: Rainwater. I'm sorry. With</p> <p>24 water.</p> <p>25 A. Unless it was a standing puddle of water, probably</p> |
| Page 55 | Page 57 |
| <p>1 Q. And what does Mr. Adams say about that?</p> <p>2 A. Page 52, he says the perc will dissolve asphalt.</p> <p>3 Q. Under what conditions is he referring to?</p> <p>4 A. He doesn't give specific conditions.</p> <p>5 Q. I'm sorry. What page is that?</p> <p>6 A. Actually pages 51 through 53.</p> <p>7 Q. I'm going to ask you on page 51 starting at line</p> <p>8 seven. Question: Okay. Other than that do you have</p> <p>9 any basis for your answer that it would be weeks or</p> <p>10 months before perc would actually noticeably begin to</p> <p>11 dissolve asphalt.</p> <p>12 Well, I think the answer is no. Let me --</p> <p>13 let me just add that I think the weeks or months --</p> <p>14 that it could be quicker, could be longer. It depends</p> <p>15 on again the rate of application, the consistency of</p> <p>16 contact, the thickness of the asphalt, you know,</p> <p>17 various things.</p> <p>18 I will ask you to read that.</p> <p>19 A. I think you read it fine.</p> <p>20 Q. Okay. Would you agree with Mr. Adams that the rate --</p> <p>21 actually, let me --</p> <p>22 Would you agree with Mr. Adams that the</p> <p>23 time it would take for perc to noticeably begin to</p> <p>24 dissolve asphalt depends on several factors -- the</p> <p>25 rate of application, consistency of contact, thickness</p> | <p>1 not.</p> <p>2 BY MR. LYNCH:</p> <p>3 Q. What if the asphalt was covered in dirt or snow or</p> <p>4 ice?</p> <p>5 MR. DAVIS: Object as to compound. I think</p> <p>6 you are asking two different or maybe a combination --</p> <p>7 I'm not sure, Chris, what you are asking. Dirt, snow</p> <p>8 and ice or dirt, snow --</p> <p>9 BY MR. LYNCH:</p> <p>10 Q. What if the asphalt was covered in dirt?</p> <p>11 MR. GROSSBART: Do you mean buried?</p> <p>12 BY MR. LYNCH:</p> <p>13 Q. A layer of dirt that -- just compacted dirt that had</p> <p>14 been -- you know, from semis driving over it.</p> <p>15 A. How thick a layer of dirt?</p> <p>16 Q. Does that make a difference?</p> <p>17 A. Sure.</p> <p>18 Q. What if it's a dusting of dirt that has been compacted</p> <p>19 into the pores of the asphalt from semi traffic?</p> <p>20 A. Dirt that got into the pores of the asphalt I don't</p> <p>21 think would have any effect. A layer -- a thick layer</p> <p>22 of dirt would probably dilute the perc a bit, maybe</p> <p>23 reduce its effect. But your question has way too many</p> <p>24 variables for me to answer.</p> <p>25 Q. I will show you what's Deposition Exhibit Number 2009.</p> |

15 (Pages 54 to 57)

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1 Q. So someone trained as an environmental engineer would
2 likely have significant knowledge of chemistry?
3 MR. DAVIS: Objection. Calls for
4 speculation.
5 A. Depends on the program. They may or may not, but they
6 should.
7 BY MR. LYNCH:
8 Q. What did you write your master's thesis on?
9 A. Kinetic and mass transfer characteristics of
10 immobilized pancreatic ribonuclease.
11 Q. For those of us who don't have a master's in chemical
12 engineering could you describe what that is in
13 laymen's terms?
14 A. The intention was to study how fast a reaction between
15 a particular enzyme and a compound called ribonucleic
16 acid would occur when the enzyme which is called
17 ribonuclease was physically attached to a porous solid
18 material.
19 Q. Does that topic have anything to do with chlorinated
20 solvents?
21 A. Anything to do? It deals with chemical reactions. It
22 deals with mass transfer. So, yes, it does.
23 Q. Specifically of chlorinated solvents?
24 A. Yes. Specifically applied to chlorinated solvents,
25 sure.

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1 MR. DAVIS: Don't ask him how.
2 THE WITNESS: It's his deposition. If he
3 wants to --
4 MR. DAVIS: I understand.
5 BY MR. LYNCH:
6 Q. After receiving your master's from University of
7 Arizona did you then go on to receive a doctorate?
8 A. Yes.
9 Q. Where was that from?
10 A. At Purdue in 1979.
11 Q. And 1979 is when you received --
12 A. My doctorate.
13 Q. You went directly from getting your master's to the
14 doctorate after that?
15 A. Yes.
16 Q. Was this also in chemical engineering -- your
17 doctorate?
18 A. Yes.
19 Q. Any particular emphasis or focus of your study or
20 research at that point?
21 A. That's the point at which I started calling myself a
22 biochemical engineer. I started dealing with
23 biochemistry and microbiology.
24 Q. What was the topic of your Ph.D. dissertation?
25 A. It was the thermodynamic characteristics of dissolving

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1 cellulose in inorganic solvents.
2 Q. Since earning your Ph.D. at Purdue have you received
3 any other degrees from any other post-secondary
4 educational institution?
5 A. Ph.D. is the terminal degree in my field. There is
6 nothing higher.
7 (Discussion off the record at 11:31 a.m.)
8 (Back on the record at 11:32 a.m.)
9 BY MR. LYNCH:
10 Q. I would like you to focus on the years from 1974 to
11 '79 -- or '68 to '79 -- the years in college.
12 A. Sure.
13 Q. Can you describe for me any coursework you had or
14 research you conducted at that time that concerned
15 chemical contamination in soils or groundwater?
16 A. Sure. Starting with my first class -- well, starting
17 with my basic chemistry and physics courses I was a
18 freshman student. I started with my calculus course
19 to understand, mathematically, contamination.
20 Going on to my sophomore year, in chemical
21 engineering we started studying mass balances and
22 energy balances. Allows you to keep track of
23 chemicals -- where they exist in processes.
24 Thermodynamics course deals with things like vapor
25 pressure and evaporation rates.

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1 Junior level courses, I would have to say
2 that, you know, two-thirds to three-quarters of my
3 courses deal -- are directly applicable to these
4 issues here.
5 Q. Regardless of whether they are directly applicable --
6 the principles of the classes -- did those courses
7 deal specifically with soil or groundwater pollution?
8 A. By specifically, what do you mean?
9 Q. Was the focus of those courses specifically chemical
10 contamination of soil or groundwater?
11 A. No, not for the most part.
12 Q. I just want to understand your testimony. Your
13 testimony is that the courses you took you acquired
14 information that's applicable to that topic?
15 A. That's right.
16 Q. Again, focusing on years 1968 to '79 did you take any
17 coursework or conduct any research that concerned the
18 make-up or properties of asphalt or concrete?
19 A. Concrete class, probably so in a couple of my civil
20 engineering classes. I don't recall about asphalt.
21 Q. And the concrete class you said would have been a
22 civil engineering class?
23 A. Yes.
24 Q. The study of concrete and asphalt --
25 A. The study of materials among which concrete -- I think

21 (Pages 78 to 81)

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| Page 82 | Page 84 |
|--|--|
| <p>1 I recall the concrete portion of that class.</p> <p>2 Q. Can you describe for me what coursework or research</p> <p>3 you did -- conducted that dealt with industry</p> <p>4 practices for handling storage or disposing of</p> <p>5 chlorinated solvents?</p> <p>6 A. Industry practices for handling storage and disposing</p> <p>7 of --</p> <p>8 Q. Or disposal of chlorinated solvents.</p> <p>9 A. Well, the industry practices for handling dealt with</p> <p>10 things like pumping, mixing. It was applicable to all</p> <p>11 solvents -- all liquid chemicals including chlorinated</p> <p>12 solvents.</p> <p>13 Q. What about any coursework that specifically focused on</p> <p>14 the industry standards or practices for storing or</p> <p>15 disposing of chlorinated solvents?</p> <p>16 A. I don't believe such courses existed. I'm not sure</p> <p>17 they exist now. So the answer is no.</p> <p>18 Q. I'd like you to take a look back at your expert</p> <p>19 report. Turn to page one of the report, please.</p> <p>20 First paragraph, second to the last sentence states,</p> <p>21 in addition during the past ten years I have made an</p> <p>22 intensive focused study of spills, leaks and other</p> <p>23 discharges of perc and perc-containing waste.</p> <p>24 Did I read that correctly?</p> <p>25 A. Yes, you did.</p> | <p>1 of perc during a fire. It just went on from there.</p> <p>2 Q. Have you taken any courses other than -- you know,</p> <p>3 since receiving your Ph.D. in connection with this</p> <p>4 intensive study of spills of perc and perc</p> <p>5 contamination?</p> <p>6 A. Yeah. I took a short course. It's called groundwater</p> <p>7 course or the Princeton groundwater course.</p> <p>8 Q. When was that?</p> <p>9 A. Probably the summer of 1996 probably.</p> <p>10 MR. LYNCH: Can we mark this next exhibit?</p> <p>11 MARKED BY THE REPORTER:</p> <p>12 DEPOSITION EXHIBIT NUMBER 2040</p> <p>13 11:40 a.m.</p> <p>14 BY MR. LYNCH:</p> <p>15 Q. Showing you what's been marked as Exhibit 2040.</p> <p>16 That's a -- I believe it's a copy of your complete</p> <p>17 resume. Is that correct?</p> <p>18 A. Yes.</p> <p>19 Q. From January 2005?</p> <p>20 A. Mm-hmm.</p> <p>21 Q. I will direct your attention to page four under the</p> <p>22 topic additional formal training.</p> <p>23 A. Right.</p> <p>24 Q. Are either of those the short course you were just</p> <p>25 referring to?</p> |
| Page 83 | Page 85 |
| <p>1 Q. Can you describe for me what that intensive focused</p> <p>2 study consisted of?</p> <p>3 A. It consisted of preparation for and participation in</p> <p>4 approximately 14 different -- 13 or 14 different cases</p> <p>5 involving perc contamination.</p> <p>6 Q. Has all of your study of perc contamination been in</p> <p>7 connection with litigation matters in which you have</p> <p>8 been retained as an expert witness?</p> <p>9 MR. DAVIS: I object to the form of the</p> <p>10 question simply -- I think you started out with</p> <p>11 talking about that second to last sentence of</p> <p>12 paragraph one of his report which is focused on the</p> <p>13 last ten years. I don't know if he could -- you know,</p> <p>14 your last question was nonrestrictive.</p> <p>15 MR. LYNCH: I will restrict it to time.</p> <p>16 BY MR. LYNCH:</p> <p>17 Q. In the past ten years has all of your study of spills,</p> <p>18 leaks and other discharges of perc and perc-containing</p> <p>19 wastes been performed in connection with testifying as</p> <p>20 an expert witness in litigation matters?</p> <p>21 A. Yes, I believe so.</p> <p>22 Q. What caused you to first begin to study that topic?</p> <p>23 A. I was approached by an attorney with a Houston law</p> <p>24 firm -- the firm was Boswell & Hallmark -- to provide</p> <p>25 expert testimony to them regarding an evaporation rate</p> | <p>1 A. It's the second one called the Princeton course.</p> <p>2 Q. Okay. Except for that course have you had any other</p> <p>3 training -- formal training on the topic of</p> <p>4 groundwater pollution and hydrology?</p> <p>5 A. No.</p> <p>6 Q. There is another short course identified in that</p> <p>7 exhibit right above that -- the short course offered</p> <p>8 by the International Network For Environmental</p> <p>9 Training. What did that short course concern or deal</p> <p>10 with?</p> <p>11 A. Dealt with bioremediation -- using microbes or enzymes</p> <p>12 to remove environmental contamination.</p> <p>13 Q. Anything in that course deal specifically with</p> <p>14 contamination by chlorinated solvents?</p> <p>15 A. I don't recall.</p> <p>16 Q. Have you published any books or articles on the topic</p> <p>17 of perchloroethylene contamination or spills?</p> <p>18 A. No.</p> <p>19 Q. Have you published any articles -- let me make sure I</p> <p>20 get the correct words here.</p> <p>21 Have you published any articles that deal</p> <p>22 with spills, leaks or other discharges of perc or</p> <p>23 perc-containing wastes?</p> <p>24 A. No.</p> <p>25 Q. Have you given any lectures or speeches on topics</p> |

22 (Pages 82 to 85)

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| Page 102 | Page 104 |
|--|---|
| <p>1 15 and number 16 and probably number 17 also.</p> <p>2 Q. Do you recall which of those cases involved asphalt as</p> <p>3 opposed to concrete?</p> <p>4 A. These were all inside locations, so it would have been</p> <p>5 concrete, I think.</p> <p>6 Q. Aside from the instant case have you ever been asked</p> <p>7 to or have you ever given an expert opinion as to the</p> <p>8 effect of perchloroethylene when it comes into contact</p> <p>9 with asphalt?</p> <p>10 A. I might have been asked about that in the first case</p> <p>11 -- case number one, but I don't recall very well.</p> <p>12 Q. Do you know what the substance of your opinion on that</p> <p>13 issue was?</p> <p>14 A. That perc will react with asphalt.</p> <p>15 Q. Did you give any opinion as to the rate at which that</p> <p>16 reaction will occur?</p> <p>17 A. No -- I don't recall.</p> <p>18 Q. Did any of the cases in which you provided expert</p> <p>19 testimony involve allegations that the perc</p> <p>20 contamination had resulted from a sudden and</p> <p>21 accidental spill of perc as opposed to continuous</p> <p>22 leakage from the machines?</p> <p>23 A. Yes.</p> <p>24 Q. Which ones were those?</p> <p>25 A. Case number one was certainly that. It was released</p> | <p>1 the question and the undefined nature of the terms you</p> <p>2 are using which obviously have legal significance in</p> <p>3 this context.</p> <p>4 A. That sounds like a legal opinion, not really my</p> <p>5 expertise.</p> <p>6 BY MR. LYNCH:</p> <p>7 Q. I'm just asking if you have ever been asked to give an</p> <p>8 opinion on those issues.</p> <p>9 A. No.</p> <p>10 Q. How many times have you been qualified by a court to</p> <p>11 provide expert testimony at trial?</p> <p>12 A. First case and the second case -- it's actually the</p> <p>13 same court, I think -- Harris County District Court.</p> <p>14 MR. DAVIS: That counts twice.</p> <p>15 THE WITNESS: Then there's two.</p> <p>16 BY MR. LYNCH:</p> <p>17 Q. Would it be the cases that indicate on here trial</p> <p>18 testimony?</p> <p>19 A. Yeah.</p> <p>20 Q. That would be the complete list of all the cases?</p> <p>21 A. Yeah.</p> <p>22 Q. Has a court ever refused or has a court ever ruled</p> <p>23 that you were not qualified to provide expert</p> <p>24 testimony in a matter?</p> <p>25 A. No.</p> |
| Page 103 | Page 105 |
| <p>1 during a fire. I think case number 15 involves it</p> <p>2 also, as does 16. I don't recall -- number 17 --</p> <p>3 whether it was an allegation of a sudden large spill</p> <p>4 or not.</p> <p>5 Q. What was the alleged spill in number 15?</p> <p>6 A. Well, it's been a while since I reviewed that, but I</p> <p>7 think it was a delivery spill. A delivery of perc to</p> <p>8 the dry cleaner was alleged to cause the</p> <p>9 contamination.</p> <p>10 Q. And in providing an expert opinion in that matter did</p> <p>11 you offer an opinion as to the validity or accuracy of</p> <p>12 that allegation?</p> <p>13 A. A spill on intact concrete -- particularly in Texas --</p> <p>14 is going to evaporate very rapidly.</p> <p>15 Q. And number 16, you said, also dealt with allegations</p> <p>16 of the sudden accidental spill?</p> <p>17 A. I can't remember on that one for sure.</p> <p>18 Q. Okay. Any other ones other than one and 15 that you</p> <p>19 do recall?</p> <p>20 A. No, not that I recall.</p> <p>21 Q. Have you ever been asked to offer an opinion as an</p> <p>22 expert as to whether a business entity should have</p> <p>23 expected or intended damage to soil or groundwater as</p> <p>24 a result of their actions?</p> <p>25 MR. GROSSBART: Objection to the form of</p> | <p>1 Q. Has a court ever struck any portion of your expert</p> <p>2 report or testimony?</p> <p>3 A. No, I don't think so.</p> <p>4 Q. Okay. I will refer you back to your report. Again,</p> <p>5 the first page, second paragraph we have talked about</p> <p>6 a little bit before.</p> <p>7 It states, Dr. Harris claims that a single</p> <p>8 large release in 1976 is responsible for the observed</p> <p>9 perc contamination at this site and gives no credence</p> <p>10 to any other possible causes of perc contamination.</p> <p>11 The facts of the case indicate otherwise as I outline</p> <p>12 below.</p> <p>13 Did I read that correctly?</p> <p>14 A. Yes.</p> <p>15 Q. In reviewing your report the only opinion I saw that</p> <p>16 suggested a possible alternative source for the</p> <p>17 contamination found at the Dyce site would be in part</p> <p>18 C, opinion C of the report.</p> <p>19 MR. GROSSBART: Where?</p> <p>20 MR. LYNCH: Opinion C, part C.</p> <p>21 BY MR. LYNCH:</p> <p>22 Q. It states perc thus evaporated from evaporation could</p> <p>23 remain for years at the bottom of ponds and could</p> <p>24 eventually permeate through concrete over long periods</p> <p>25 of time. Perc would attack and eventually dissolve</p> |

27 (Pages 102 to 105)

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| Page 110 | Page 112 |
|---|---|
| <p>1 MR. LYNCH: Page five.</p> <p>2 BY MR. LYNCH:</p> <p>3 Q. Opinion number two and three.</p> <p>4 A. Which page are you on?</p> <p>5 Q. Page five, opinions two and three.</p> <p>6 A. All right.</p> <p>7 Q. Can you read those opinions?</p> <p>8 A. The site –</p> <p>9 Q. No, no. Just to yourself is fine.</p> <p>10 A. Okay. Sure. Yes. I have read them.</p> <p>11 Q. Are those the two opinions to which you offer rebuttal</p> <p>12 testimony?</p> <p>13 MR. GROSSBART: Objection to the form of</p> <p>14 the question.</p> <p>15 A. I would also rebut four. I believe I rebut five. I</p> <p>16 would say two through five.</p> <p>17 BY MR. LYNCH:</p> <p>18 Q. Two through five?</p> <p>19 A. Mm-hmm.</p> <p>20 Q. Not one?</p> <p>21 A. I'm not a student of the regulations, so I wouldn't</p> <p>22 really deal with that issue.</p> <p>23 Q. What about state of the practice, standards in the</p> <p>24 industry?</p> <p>25 A. State of the practice means as bad as everybody else.</p> | <p>1 but I also notice in your report you don't make</p> <p>2 mention of any intentional discharges from any of the</p> <p>3 containment systems at the Dyce facility.</p> <p>4 MR. GROSSBART: Objection to the form of</p> <p>5 the question.</p> <p>6 BY MR. LYNCH:</p> <p>7 Q. Is that correct?</p> <p>8 MR. GROSSBART: Objection to the form of</p> <p>9 the question.</p> <p>10 A. That's right. I don't.</p> <p>11 BY MR. LYNCH:</p> <p>12 Q. Okay. Am I correct that since it is not mentioned in</p> <p>13 your report you have not formed an opinion as to</p> <p>14 whether such discharges may or may not have occurred?</p> <p>15 A. Well, there was – I know that there was discharges.</p> <p>16 They talk about running the one containment pond when</p> <p>17 it got too full. They talked about draining that out</p> <p>18 into the pasture. What was the content of that</p> <p>19 drainage, I have no idea.</p> <p>20 Q. Have you formed an opinion as to whether or not that's</p> <p>21 a source of the contamination at the Dyce site?</p> <p>22 A. No.</p> <p>23 Q. I also notice in your report that you don't discuss</p> <p>24 any allegations concerning the dumping of liquid from</p> <p>25 drums that were returned to the site.</p> |
| Page 111 | Page 113 |
| <p>1 I don't know. No. I don't know what the state of the</p> <p>2 practice was. It's not my expertise.</p> <p>3 Q. Let's look a little bit more closely at number four.</p> <p>4 I will direct your – let me look for it. We can</p> <p>5 short-circuit this.</p> <p>6 In your report, you don't discuss or make</p> <p>7 mention of any allegations of there being overflows or</p> <p>8 intentional discharges from any containment system at</p> <p>9 the Dyce facility. Is that correct?</p> <p>10 A. Overflows or discharges – potential discharges from</p> <p>11 containment – no. I don't believe I reference that.</p> <p>12 Q. Am I correct that since it is not discussed in your</p> <p>13 report you haven't formed an opinion as to whether</p> <p>14 such events occurred?</p> <p>15 A. I don't know one way or the other.</p> <p>16 Q. Okay. And am I correct that you haven't formed an</p> <p>17 opinion as to whether those events, if they occurred,</p> <p>18 might have contributed to any of the contamination</p> <p>19 found at the Dyce site?</p> <p>20 A. Just based on the physical properties of perc, an</p> <p>21 overflow of a containment pond would be almost</p> <p>22 certainly an overflow of water. Wouldn't be any</p> <p>23 dissolved perc in that. I find that probably not a</p> <p>24 significance source.</p> <p>25 Q. I don't know if we covered this in the last question,</p> | <p>1 Is it true that you don't discuss those</p> <p>2 allegations in your report?</p> <p>3 A. I think they are contained within my opinion about the</p> <p>4 normal practices for cleaning barrels and, you know,</p> <p>5 cleaning other vessels.</p> <p>6 Q. How about with respect to the dumping of liquid from</p> <p>7 drums that were being picked up by a barrel</p> <p>8 reconitioner?</p> <p>9 A. Again, as much as that's the normal expected practice</p> <p>10 for handling vessels that contain perc, I think it's</p> <p>11 contained within my opinions.</p> <p>12 Q. Have you formed an opinion as to whether if that</p> <p>13 practice had occurred – if that practice occurred if</p> <p>14 it was a source of any of the contamination found at</p> <p>15 the Dyce site?</p> <p>16 A. I'm not really dealing with contamination. I don't</p> <p>17 think I offer a single opinion regarding actually how</p> <p>18 the contamination occurred. My opinions – my report,</p> <p>19 as I have said before, is a rebuttal of Dr. Harris's</p> <p>20 report.</p> <p>21 Q. Based on your review of the evidence cited in your</p> <p>22 report what do you understand to be the practice of</p> <p>23 Dyce Chemical with respect to handling drums that were</p> <p>24 returned to be picked up by a barrel reconitioner?</p> <p>25 A. Well, the barrels were washed, reused if they could</p> |

29 (Pages 110 to 113)

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| Page 134 | Page 136 |
|---|---|
| <p>1 BY MR. LYNCH:</p> <p>2 Q. From what you are telling me, I take it, if someone</p> <p>3 spilled perc onto concrete at Dyce or an asphalt</p> <p>4 surface at Dyce they would have no reason to expect</p> <p>5 that the spill would permeate through the asphalt or</p> <p>6 concrete and reach the soil.</p> <p>7 A. That's right. As long as it is intact, no big holes</p> <p>8 in it.</p> <p>9 Q. That's another variable that would have to be</p> <p>10 considered -- whether the asphalt or concrete was</p> <p>11 intact?</p> <p>12 A. Yes.</p> <p>13 Q. The presence of joints in the asphalt or concrete,</p> <p>14 would that make a difference?</p> <p>15 A. This is getting somewhat outside my expertise, but I</p> <p>16 understand most joints for concrete do not go all the</p> <p>17 way through. They go an inch or two into the depth of</p> <p>18 the concrete.</p> <p>19 MR. DAVIS: I don't think you have joints</p> <p>20 with asphalt.</p> <p>21 THE WITNESS: No, you don't.</p> <p>22 MR. DAVIS: It's a continuous pour.</p> <p>23 THE WITNESS: It's a continuous pour.</p> <p>24 BY MR. LYNCH:</p> <p>25 Q. Any other variables that might affect the evaporation</p> | <p>1 the asphalt -- different amounts of air space within</p> <p>2 the asphalt?</p> <p>3 A. Not that I know of.</p> <p>4 Q. Do you know whether there are different types of</p> <p>5 asphalt binder that are used to bind this asphalt</p> <p>6 together -- bind the aggregate together?</p> <p>7 A. I don't know.</p> <p>8 Q. Do you know if there is any binders used to create</p> <p>9 pavement that might have a different chemical make-up?</p> <p>10 A. I don't know.</p> <p>11 Q. Do you know whether or not the type of binder that's</p> <p>12 used to bind the aggregate might have an effect on how</p> <p>13 rapidly perc may or may not react with the asphalt?</p> <p>14 A. Well, if the binder is itself a hydrocarbon then it</p> <p>15 probably will be attacked and dissolved by perc also.</p> <p>16 If it's not a hydrocarbon, it's probably</p> <p>17 inert. It probably would not affect perc's action on</p> <p>18 the asphalt.</p> <p>19 Q. If it is a hydrocarbon do hydrocarbons all react</p> <p>20 uniformly in the presence of perchloroethylene?</p> <p>21 A. No.</p> <p>22 Q. So if a certain hydrocarbon had one chemical</p> <p>23 composition and another hydrocarbon had a different</p> <p>24 chemical composition, they could dissolve at different</p> <p>25 rates?</p> |
| Page 135 | Page 137 |
| <p>1 rates of perc?</p> <p>2 A. I believe I have just stated all that.</p> <p>3 Q. Opinion capital B, part B states perc is a good</p> <p>4 solvent for hydrocarbon compounds such as asphalt and</p> <p>5 will dissolve the hydrocarbon portion of the asphalt.</p> <p>6 What do you mean perc is a good solvent?</p> <p>7 A. It means it will dissolve, bring to solution</p> <p>8 hydrocarbon compounds like asphalt. Water is a poor</p> <p>9 solvent for asphalt. Perc is a good solvent.</p> <p>10 Q. Do you have an understanding as to the make-up or the</p> <p>11 constituents of what makes up asphalt pavement?</p> <p>12 A. Yes.</p> <p>13 Q. A paved area of asphalt, is that all hydrocarbon</p> <p>14 compounds?</p> <p>15 A. No.</p> <p>16 Q. What else is there?</p> <p>17 A. Rock, gravel. It's called the aggregate part of it.</p> <p>18 Q. How much of the actual asphalt pavement is made up of</p> <p>19 the aggregate?</p> <p>20 A. I don't know.</p> <p>21 Q. Any idea of a range?</p> <p>22 A. Probably about half of it by mass. I would say more</p> <p>23 than half by mass is rock.</p> <p>24 Q. Are there different -- depending on what the asphalt</p> <p>25 is used for, are there different compression levels to</p> | <p>1 A. They could.</p> <p>2 Q. Do you know what types of aggregate were used to</p> <p>3 create pavement in the 1970s?</p> <p>4 A. No.</p> <p>5 Q. Would the type of aggregate have any effect on how</p> <p>6 rapidly perc might react with the asphalt?</p> <p>7 A. As long as the aggregate is rock or gravel, probably</p> <p>8 not.</p> <p>9 Q. What if the aggregate was more densely packed?</p> <p>10 A. Do you mean less hydrocarbon and more asphalt -- I'm</p> <p>11 sorry -- more asphalt and less --</p> <p>12 MR. DAVIS: Aggregate.</p> <p>13 BY MR. LYNCH:</p> <p>14 Q. More aggregate --</p> <p>15 A. More aggregate and less asphalt -- more aggregate and</p> <p>16 less hydrocarbon?</p> <p>17 Q. Mm-hmm.</p> <p>18 A. Well, if that's the case, then for the same size spill</p> <p>19 of perc under the same conditions you would see more</p> <p>20 of the aggregate exposed to a spill because the perc</p> <p>21 would dissolve proportionally more of it.</p> <p>22 Q. Are you aware of any studies, publications or</p> <p>23 authorities that discuss the use of perc as a solvent</p> <p>24 for dissolving asphalt?</p> <p>25 A. I believe the ASTM standards for testing of asphalt</p> |

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|---|--|
| <p>1 actually involve either perc or perchloroethylene --</p> <p>2 I'm sorry -- perc or TCE, its chemical cousin. But</p> <p>3 I'm not sure on that.</p> <p>4 Q. Any other studies, publications or authorities that</p> <p>5 might discuss perc as a solvent for dissolving</p> <p>6 asphalt?</p> <p>7 A. Not that I recall.</p> <p>8 Q. Have you ever used perc as a solvent for dissolving</p> <p>9 asphalt?</p> <p>10 A. Yes.</p> <p>11 Q. Describe that situation.</p> <p>12 A. I have a small bottle of perc at home. And I have</p> <p>13 just dissolved bits of asphalt in it to satisfy myself</p> <p>14 that it actually happens.</p> <p>15 Q. How much perc is in that bottle?</p> <p>16 A. I have a gallon of perc. I probably used a couple</p> <p>17 ounces in it in this test.</p> <p>18 Q. How big was the piece of asphalt?</p> <p>19 A. Oh, about the size of a quarter in diameter.</p> <p>20 Q. Did you conduct this test in connection with forming</p> <p>21 the opinions expressed in your report?</p> <p>22 A. No.</p> <p>23 Q. When did you conduct this test?</p> <p>24 A. About three years ago.</p> <p>25 Q. How did you go about dissolving perc in the asphalt --</p> | <p>1 surface area exposed, the faster it would dissolve.</p> <p>2 Q. Do you know if the composition of asphalt changes at</p> <p>3 all as the asphalt ages?</p> <p>4 A. Yes, it does.</p> <p>5 Q. What happens?</p> <p>6 A. The so-called lighter hydrocarbons -- the ones that</p> <p>7 are more volatile -- tend to disappear, evaporate.</p> <p>8 Q. Would the age of the asphalt have any effect on how</p> <p>9 rapidly it might dissolve in perc?</p> <p>10 A. Some probably.</p> <p>11 Q. How so?</p> <p>12 A. Well, the older asphalt would have more of the high</p> <p>13 molecular weight. Less volatile compounds would tend</p> <p>14 to be the ones that were less soluble also.</p> <p>15 Q. The test you conducted with the piece of asphalt,</p> <p>16 where did you obtain that asphalt?</p> <p>17 A. Side of the road by my house.</p> <p>18 Q. Do you know whether in the '70s any additives were</p> <p>19 added to asphalt -- things like anti-stripping</p> <p>20 additives, things of that nature?</p> <p>21 A. No.</p> <p>22 Q. Do you have any knowledge as to what type of additives</p> <p>23 might be added to asphalt at any time as a matter of</p> <p>24 industry practice?</p> <p>25 A. Maybe we can finish this line. I have no knowledge of</p> |
| Page 139 | Page 141 |
| <p>1 or the asphalt in perc?</p> <p>2 A. Put the perc in a small beaker and dropped the chunk</p> <p>3 of asphalt into it, swished it around a little bit.</p> <p>4 It dissolves.</p> <p>5 Q. How long did that take?</p> <p>6 A. Well, I started to see some of the color -- perc is</p> <p>7 clear. But as soon as I dropped the asphalt in it, it</p> <p>8 started to turn dark.</p> <p>9 Q. Mm-hmm.</p> <p>10 A. I would say all of the aggregate was exposed and loose</p> <p>11 as gravel within a period of a minute or two.</p> <p>12 Q. Was the asphalt completely surrounded by the perc?</p> <p>13 A. Yes.</p> <p>14 Q. Submerged in the perc?</p> <p>15 A. Almost completely.</p> <p>16 Q. Any other instance where you have ever witnessed perc</p> <p>17 reacting with asphalt?</p> <p>18 A. No.</p> <p>19 Q. Would the porosity or permeability of the asphalt have</p> <p>20 any effect on the rate or degree to which perc might</p> <p>21 react with the asphalt?</p> <p>22 A. Yes.</p> <p>23 Q. How so?</p> <p>24 A. The more porous or more permeable, the easier it would</p> <p>25 be for the perc to get at the asphalt. The more</p> | <p>1 what additives there are or ever have been or ever</p> <p>2 will be in asphalt.</p> <p>3 Q. So I take it you also have no knowledge as to whether</p> <p>4 any additives that might have been added to asphalt</p> <p>5 might affect the rate at which asphalt reacts with</p> <p>6 perc?</p> <p>7 A. I think I answered that question with regard to</p> <p>8 whether there was a hydrocarbon additive or something</p> <p>9 was not a hydrocarbon additive. That's the substance</p> <p>10 of my testimony.</p> <p>11 Q. Okay. Do you have any knowledge as to whether perc's</p> <p>12 reaction with asphalt is -- or perc reacts with</p> <p>13 asphalt more quickly than TCE would react with</p> <p>14 asphalt?</p> <p>15 A. I don't know.</p> <p>16 Q. Okay. Do you have any knowledge as to what the</p> <p>17 typical extraction times might be using TCE to extract</p> <p>18 vitamin from asphalt?</p> <p>19 A. No.</p> <p>20 Q. Any knowledge as to what temperatures and what those</p> <p>21 tests might be conducted at routinely?</p> <p>22 A. No.</p> <p>23 Q. Would the temperature make a difference --</p> <p>24 A. Sure.</p> <p>25 Q. -- as to how quickly perc reacts with asphalt?</p> |

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|--|---|
| <p>1 A. Of course.</p> <p>2 Q. How so?</p> <p>3 A. Well, in general, compounds are more soluble as</p> <p>4 temperature increases. So the warmer it is, the more</p> <p>5 asphalt we could dissolve in perc.</p> <p>6 Also, the mass transfer coefficient --</p> <p>7 which is the rate of dissolution -- would tend to</p> <p>8 increase as you increase temperature.</p> <p>9 Q. Do other solvents such as BTEX compounds -- do you</p> <p>10 know what I mean by BTEX compounds?</p> <p>11 A. Yes.</p> <p>12 Q. Do they also dissolve the hydrocarbons in asphalt?</p> <p>13 A. Yes.</p> <p>14 Q. Are those better solvents than perc when it comes to</p> <p>15 dissolving asphalt?</p> <p>16 A. I don't know.</p> <p>17 Q. You don't have any knowledge one way or another as to</p> <p>18 whether the reaction would be quicker with --</p> <p>19 A. I don't know.</p> <p>20 Q. Opinion B(b) again. If spilled on asphalt perc would</p> <p>21 dissolve some of the asphalt and then would slowly</p> <p>22 evaporate from the resulting asphalt/perc mixture.</p> <p>23 How quickly -- first, would any of the perc</p> <p>24 evaporate before it dissolved into the asphalt?</p> <p>25 A. Yes.</p> | <p>1 did?</p> <p>2 A. Yes.</p> <p>3 Q. You have no other knowledge as to how the asphalt</p> <p>4 that's remaining after the perc evaporates might look?</p> <p>5 A. No. I disagree.</p> <p>6 Q. What other bases do you have?</p> <p>7 A. Just my understanding of what -- when you evaporate a</p> <p>8 liquid out of something you have dissolved, the</p> <p>9 remaining material that's left behind does have a</p> <p>10 uniform, you know, appearance. That's what happens.</p> <p>11 Q. Opinion B, part C, talking about the alleged large</p> <p>12 spill of 250 or more gallons of perc on asphalt, Dyce</p> <p>13 Chemical, 1976.</p> <p>14 You state that it's highly unlikely such a</p> <p>15 spill actually occurred and then you identify two</p> <p>16 bases for that statement. I think we talked about</p> <p>17 this before. Are those the only bases you have for</p> <p>18 this statement?</p> <p>19 A. No.</p> <p>20 Q. What other bases do you have?</p> <p>21 A. It was never reported.</p> <p>22 Q. Anything else?</p> <p>23 A. I have to look at one of my exhibits.</p> <p>24 Q. Which?</p> <p>25 A. It's in my file.</p> |
| Page 143 | Page 145 |
| <p>1 Q. What portion or percentage?</p> <p>2 A. I don't know. Depend on the conditions.</p> <p>3 Q. No way of answering that without knowing the</p> <p>4 particular conditions?</p> <p>5 A. I think that's true.</p> <p>6 Q. Then you state it would evaporate slowly from the</p> <p>7 resulting asphalt/perc mixture. How quickly would</p> <p>8 that evaporation occur?</p> <p>9 A. For a large spill it would be probably a matter of</p> <p>10 hours rather than minutes for perc on concrete.</p> <p>11 Q. I'm sorry. Concrete or asphalt?</p> <p>12 A. Perc spilled on concrete will evaporate in minutes or</p> <p>13 less -- even a large spill. Perc spilled on asphalt</p> <p>14 will evaporate, I believe, over a matter of hours</p> <p>15 rather than minutes. It's much slower -- at least ten</p> <p>16 times slower.</p> <p>17 Q. When perc evaporates from the asphalt/perc mixture</p> <p>18 what's left over?</p> <p>19 A. The asphalt.</p> <p>20 Q. In appearance, how is that asphalt different than it</p> <p>21 was before the perc came in contact with it?</p> <p>22 A. It looked shinier. It was -- you know, in the</p> <p>23 experiment I did it looked shinier and it was a</p> <p>24 homogenous mass rather than more heterogeneous.</p> <p>25 Q. Is that opinion based solely on the experiment you</p> | <p>1 MR. DAVIS: Your summary?</p> <p>2 THE WITNESS: The summary.</p> <p>3 MR. DAVIS: The thing you prepared on</p> <p>4 Saturday?</p> <p>5 THE WITNESS: I would like to take a break</p> <p>6 while we find that.</p> <p>7 (Off the record at 2:05 p.m.)</p> <p>8 (Back on the record at 2:14 p.m.)</p> <p>9 BY MR. LYNCH:</p> <p>10 Q. Dr. Dale, I'm showing you what was previously marked</p> <p>11 as Exhibit 2031 in this case. Is that the document</p> <p>12 you were referring to that listed some additional</p> <p>13 bases for your opinion that it is highly unlikely that</p> <p>14 such a perc spill actually occurred?</p> <p>15 A. Right.</p> <p>16 Q. Direct your attention to the next sheet, item number</p> <p>17 one, second CERCLA request. Part A states no incident</p> <p>18 reports, logs prior to the 1992 -- prior to 1992 of</p> <p>19 leaks or spills.</p> <p>20 Do you have an opinion as to whether any</p> <p>21 leaks or spills occurred prior to 1992 of perc?</p> <p>22 A. I'm sure they did.</p> <p>23 Q. Okay. So the mere absence of logs or reports doesn't</p> <p>24 preclude the fact that perc may have been spilled</p> <p>25 prior to that date?</p> |

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1 **BY MR. LYNCH:**
 2 Q. You are here today testifying as an expert witness.
 3 A. Correct.
 4 Q. I'm just wondering if there is anything in your --
 5 could a layperson -- is a layperson equally capable of
 6 reading Mr. Hallsten's deposition testimony and
 7 concluding whether or not it either supports or
 8 contradicts the existence of a spill of perc in about
 9 1976?
 10 A. I don't know what the layperson would conclude. I do
 11 know that if the only large spill of which there is
 12 deposition testimony occurred in the summer and the
 13 quarterly reconciliation discrepancy is in the spring
 14 that you can't get those two together.
 15 Q. Okay. And that's, again, based --
 16 A. There is no --
 17 Q. That's based upon common sense, not an expert --
 18 A. Yeah.
 19 MR. GROSSBART: Object to the form of the
 20 question.
 21 **BY MR. LYNCH:**
 22 Q. Down to number seven, the Johnson deposition you cite.
 23 Did Mr. Johnson work at Dyce in the 1970s?
 24 A. I think -- I don't recall. I think he said he started
 25 in the early '80s, but I don't recall.

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1 Q. Except for the items that are cited in your expert
 2 report and the additional items that are cited in this
 3 document, Exhibit 2031, do you have any other factual
 4 or evidentiary basis on which you base your conclusion
 5 that it is highly unlikely that such a perc spill
 6 actually occurred?
 7 A. No.
 8 Q. Next sentence in that same portion of your report,
 9 opinion B(c), you state first such a large spill of
 10 perc would have damaged or discolored a large area of
 11 asphalt. You are assuming here a spill of 250 gallons
 12 of perc?
 13 A. Yes.
 14 Q. How much damage would it have caused?
 15 A. A significant amount of damage.
 16 Q. What do you mean by significant?
 17 A. It would have washed away the aggregate -- the asphalt
 18 of a significant patch of aggregate -- several square
 19 feet at least. It would have been noticeable.
 20 Q. Would the extent of the damage caused by such a spill
 21 have depended on any variables?
 22 A. Of course.
 23 Q. Such as?
 24 A. How fast the perc was released.
 25 Q. What difference does that make?

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1 A. Well, if it's released very, very slowly then it may
 2 cause comparatively little damage to the asphalt. It
 3 may evaporate faster than it dissolves the asphalt.
 4 If it is released essentially
 5 instantaneously then it will be like -- perc is very
 6 heavy, very dense -- 1.6 times heavier than water. If
 7 it's released quickly it's going to act like a blast
 8 of solvent and just remove a large quantity of asphalt
 9 from the -- large quantity of hydrocarbon from the
 10 asphalt.
 11 Q. Have you ever observed that happening --
 12 A. No.
 13 Q. -- perc being released quickly onto asphalt -- a large
 14 quantity?
 15 A. No.
 16 Q. What's the basis for that?
 17 A. Physics and chemistry.
 18 Q. Any other variables other than how fast the perc is
 19 released?
 20 A. The temperature, obviously clean-up attempts. I have
 21 testified to that before. I believe I'm repeating
 22 testimony at this point.
 23 Q. What did you assume the temperature was as the basis
 24 for this opinion that such a large spill would have
 25 damaged or discolored asphalt?

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1 A. Yeah. Any temperature between close to freezing and
 2 about 70 to 80 degrees Fahrenheit.
 3 Q. What about below freezing?
 4 A. The perc would not have been below freezing. The
 5 asphalt may have been, but the perc would not have
 6 been.
 7 Q. If the asphalt was below freezing?
 8 A. Maybe slower reaction, less damage.
 9 Q. How much slower?
 10 A. I don't know.
 11 Q. How much less damage?
 12 A. I don't know.
 13 Q. We talked a little bit about how fast the perc is
 14 released. Would it also make a difference as to what
 15 angle the perc is released at?
 16 MR. GROSSBART: Objection.
 17 MR. DAVIS: Objection. Vague. I don't
 18 know what you mean by angle. Do you?
 19 THE WITNESS: No.
 20 **BY MR. LYNCH:**
 21 Q. If the perc was sprayed from a hose directly onto the
 22 concrete as opposed to being sprayed out and then
 23 falling onto the concrete -- I'm sorry -- asphalt.
 24 Would that make a difference?
 25 A. I think the most important variable there is how high

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| Page 158 | Page 160 |
|---|---|
| <p>1 Q. Any realistic conditions.</p> <p>2 A. No.</p> <p>3 Q. Have you ever seen asphalt that's been dissolved by</p> <p>4 perc except for the experiment you conducted?</p> <p>5 MR. DAVIS: Asked and answered.</p> <p>6 A. No.</p> <p>7 BY MR. LYNCH:</p> <p>8 Q. Part B(c), second basis states such a large spill of</p> <p>9 perc would have produced a strong odor over a very</p> <p>10 large area and would have been noticed by Dyce</p> <p>11 employees or Dyce neighbors.</p> <p>12 Did I read that correctly?</p> <p>13 A. I didn't have very large area. You said very large.</p> <p>14 Q. I'm sorry.</p> <p>15 A. I just said large. Otherwise yes. Otherwise correct.</p> <p>16 Q. Have you ever been present when a spill of 250 to</p> <p>17 1,000 gallons of perc occurred?</p> <p>18 A. Been present at a spill of about a half gallon of</p> <p>19 perc.</p> <p>20 Q. How close were you?</p> <p>21 A. Three, four feet away.</p> <p>22 Q. Indoors or outdoors?</p> <p>23 A. Indoors.</p> <p>24 Q. How large of an area would the strong odor have been</p> <p>25 noticeable in?</p> | <p>1 cleaning it up with protective gear and he didn't</p> <p>2 smell it. He would have smelled it.</p> <p>3 Q. Did he say he didn't smell it or did he say he didn't</p> <p>4 recall?</p> <p>5 A. He doesn't testify to having smelled it.</p> <p>6 Q. Do you know if he testified whether he recalls whether</p> <p>7 or not perc had any smell?</p> <p>8 A. I don't know.</p> <p>9 MR. GROSSBART: The "he" in your question</p> <p>10 is Bender --</p> <p>11 MR. LYNCH: Mr. Slater. I'm sorry.</p> <p>12 THE WITNESS: I don't know what Mr. Slater</p> <p>13 knows about perc smell.</p> <p>14 Well, take that back. He put his head in</p> <p>15 those barrels. I'm recalling his testimony. Yeah.</p> <p>16 He said it made his eyes run, choking, gasping.</p> <p>17 BY MR. LYNCH:</p> <p>18 Q. You indicated that it would certainly have been</p> <p>19 smelled by anyone in the Dyce warehouse or office. Is</p> <p>20 that correct?</p> <p>21 A. That's right.</p> <p>22 Q. Does it make a difference if the wind was blowing the</p> <p>23 opposite direction and the windows were closed?</p> <p>24 A. Opposite direction of --</p> <p>25 Q. Blowing away from the office.</p> |
| Page 159 | Page 161 |
| <p>1 A. Probably depends on wind direction and actually how</p> <p>2 fast it got spilled, but certainly over the entire</p> <p>3 Dyce complex.</p> <p>4 If that spill took place in the loading</p> <p>5 dock area the people in the main building -- office</p> <p>6 building would certainly have known about it.</p> <p>7 Q. What is the basis for that opinion?</p> <p>8 A. Because perc at about 100 parts per million --</p> <p>9 one-tenth of one percent -- makes your eyes water. At</p> <p>10 about 300 parts per million -- makes your eyes water,</p> <p>11 your nose stream, you have a real difficult time. 200</p> <p>12 to 300 parts per million you have difficulty</p> <p>13 breathing. 500 parts per million you become</p> <p>14 intoxicated and die. People would have remembered</p> <p>15 that spill.</p> <p>16 By the way, that's why I know that the</p> <p>17 spill that Mr. Slater witnessed was not a perc spill.</p> <p>18 MR. GROSSBART: I'm sorry. I didn't hear</p> <p>19 the last --</p> <p>20 THE WITNESS: That's why I know that the</p> <p>21 spill that Mr. Slater witnessed in the summer of 1976</p> <p>22 couldn't have been a perc spill.</p> <p>23 BY MR. LYNCH:</p> <p>24 Q. Why is that?</p> <p>25 A. Because Mr. Bender didn't testify that Mr. Bender was</p> | <p>1 A. Where that spill -- the places where the perc could</p> <p>2 have spilled were right next to the office and the</p> <p>3 warehouse. No, I don't think so. Particularly since</p> <p>4 perc spreads out as it spills.</p> <p>5 Q. Going back to the 1975 photo -- if we can find it.</p> <p>6 A. Mm-hmm.</p> <p>7 Q. Using that photo can you show me where the office is?</p> <p>8 A. Right in this area.</p> <p>9 Q. Okay. Do you know, is the -- strike that.</p> <p>10 And your understanding of where the perc</p> <p>11 spill occurred is --</p> <p>12 A. Well, I don't believe there was a perc spill, but</p> <p>13 where it was alleged to have spilled would be in this</p> <p>14 area.</p> <p>15 Q. TouchT.</p> <p>16 MR. DAVIS: That's one of his sneaky trick</p> <p>17 questions.</p> <p>18 THE WITNESS: I have five kids.</p> <p>19 BY MR. LYNCH:</p> <p>20 Q. On that diagram can you indicate how large of an area</p> <p>21 the perc spill would have been noticeable over?</p> <p>22 MR. DAVIS: Assuming for the sake of</p> <p>23 argument that there was a perc spill.</p> <p>24 A. I don't know the scale, but I'm assuming it's about</p> <p>25 one inch equals 50 feet. It's about right -- the perc</p> |

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|---|---|
| <p>1 spill would have covered about this area here between 2 the end of the warehouse and -- 3 BY MR. LYNCH: 4 Q. Is there -- 5 A. Let me add to my response of a previous question. 6 Prevailing winds in Billings are from the 7 northwest -- this direction. A spill here would have 8 taken the odor directly toward the office based on 9 prevailing winds. 10 Q. Those are prevailing winds throughout the year? 11 A. Pretty much. 12 Q. Do you have an understanding as to whether this area 13 that's labeled PCE handling in 1975 to 1980 -- was 14 that sloped in any direction? 15 A. I don't know about the slope. 16 Q. Would it have made a difference if the perc was 17 flowing off of that area -- away from that area? 18 Would that have any difference on your opinion? 19 MR. DAVIS: The opinion on -- 20 MR. LYNCH: On the area covered by the area 21 -- strong odor of perc. 22 A. No. 23 BY MR. LYNCH: 24 Q. Why not? 25 A. If the wind comes from this direction or just this</p> | <p>1 drumming operation the odor would be 1,000 times as 2 great -- 250 gallon spill versus one quart. 3 I'd like to add to my testimony. 4 Mr. Naff's deposition, page 131 says 100 gallons of 5 perc on asphalt would have been noticed -- he refers 6 to odor. But no one came to him saying they knew 7 about the spill. It is not only my opinion regarding 8 the strong odor but also Mr. Naff's. 9 Q. You indicate that Dyce's neighbors would have noticed 10 the odor. 11 MR. GROSSBART: Objection to the form of 12 the question. 13 BY MR. LYNCH: 14 Q. Is that correct? 15 A. Anybody -- yes. Anybody downwind of it would have 16 noticed. 17 Q. How far downwind? 18 A. I don't know. 19 Q. Do you know how far their nearest neighbor is? 20 A. There was another company up here -- I don't know 21 where they are, not for sure. 22 Q. Part C of your report states perc discharged to ponds 23 or basins where water is present will evaporate very 24 slowly or not at all. 25 A. That's correct. It does say that.</p> |
| Page 163 | Page 165 |
| <p>1 area, it's going to spread out. The vapor cloud from 2 the perc will evaporate and then will start to spread 3 out. It'll just tend to cover this whole area. And 4 it will be smeared in this direction toward the 5 warehouse, toward the offices, smeared toward the 6 southeast from the northwest by the winds. 7 Q. What's the basis for your testimony as to the 8 direction of the prevailing winds in Billings? 9 A. Personal knowledge of having lived at the foot of 10 mountains in Colorado and also the general direction 11 of winds. It may be that it's on this weather report 12 also. Not here, so no. 13 Q. Do you have any understanding or knowledge as to how 14 much of an odor was created during routine unloading 15 -- the routine loading or unloading or drumming of 16 perc in that area? 17 A. I believe that one or more of the witnesses recalls -- 18 does speak about odors from perc. But I don't recall 19 whether it's from the drumming or not. 20 Q. I know you characterized or you have opined that a 21 large spill of perc would have produced a strong odor. 22 How strong of an odor would that be as 23 compared to an odor produced during a normal drumming 24 or unloading operation? 25 A. Well, it's -- if you dropped a quart during the</p> | <p>1 Q. Is that just a general principle based on your 2 knowledge of chemistry? 3 A. Yes. 4 Q. Do you have any opinion as to how quickly any of the 5 -- any perc that might have been discharged into a 6 containment unit on the Dyce facility would have 7 evaporated? 8 A. If it was covered with water it would never evaporate. 9 As long as it stays covered with water it would never 10 evaporate. 11 Q. Would any portion of the perc become dissolved into 12 the water? 13 A. Very small amount. 14 Q. Would the dissolved portion evaporate? 15 A. It could. 16 Q. If there were BTEX compounds in the water would they 17 tend to dissolve any perc that may be there? 18 A. I'm sorry? 19 Q. If there were any BTEX compounds in the water would 20 that dissolve any perc that might be in there? 21 A. It would depend on the relative amounts. If there 22 were a lot more BTEX than perc then, yeah, it would 23 dissolve the perc. If not it would be the other way 24 around. The perc would dissolve the BTEX. 25 Q. Would it make a difference as to whether the perc</p> |

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|--|--|
| <p>1 moves in the subsurface once it permeates the surface 2 of the ground?</p> <p>3 A. It's complicated. It's denser than water, so it 4 sinks. It sinks until it reaches an impervious layer. 5 It then may migrate along that impervious layer. It 6 may spread out. It's complicated.</p> <p>7 Q. Is it your opinion that the information as to the 8 location and nature of the contamination found at the 9 Dyce site indicates that the contamination was more 10 likely to have been caused by the subsurface migration 11 of DNAPL perc from a historic containment area than 12 from a spill in the loading/unloading area that flowed 13 above ground to the northwest corner?</p> <p>14 MR. GROSSBART: Objection to the form of 15 the question.</p> <p>16 A. That's quite a complex question. I have told you 17 before that the scope of my assignment here is really 18 to deal with the rebuttal of Dr. Harris's report. 19 But I will tell you that from what I do 20 understand it looks as if this was a surface release 21 up here. There are higher concentrations near the 22 surface in this area of the northwest corner -- the 23 extreme northwest corner whereas if it had been 24 released from the bottom of a containment pond and 25 migrated in the subsurface that would be less likely</p> | <p>1 and whether they could be a cause of contamination?</p> <p>2 MR. DAVIS: What was --</p> <p>3 MR. LYNCH: Strike that. Bad question.</p> <p>4 BY MR. LYNCH:</p> <p>5 Q. Are you intending to offer an opinion at trial or in 6 any affidavit in connection with this matter that the 7 source of the contamination found in the northwest 8 corner of the Dyce site -- what we have been calling 9 the hot spot -- resulted from a discharge of water 10 from containment as opposed to water permeating 11 through the bottom of the containment structure?</p> <p>12 MR. DAVIS: Object to the form of your 13 question. You are talking about discharge of water. 14 I don't think discharge of water caused any problems 15 other than --</p> <p>16 MR. LYNCH: Discharge of liquids.</p> <p>17 A. Maybe I can recap. I was asked to rebut the opinions 18 of Dr. Harris. Dr. Harris's offered explanation for 19 the contamination here in the far northwest corner of 20 the site was that there was a surface spill of 250 21 gallons or more of perc down here near the warehouse 22 and dock and that somehow that 250-gallon spill 23 migrated over land leaving little or no trace and 24 discharged here at the surface in the northwest 25 corner.</p> |
| Page 203 | Page 205 |
| <p>1 to be the source -- the containment pond.</p> <p>2 BY MR. LYNCH:</p> <p>3 Q. I just want to clarify because I'm a little confused 4 with your testimony.</p> <p>5 Do you have an opinion as to what the cause 6 of the contamination found in the so-called hot spot 7 area is in the northwest corner of the Dyce site?</p> <p>8 MR. GROSSBART: Objection to the form of 9 the question.</p> <p>10 A. Again, you are outside of my area of expertise. Given 11 the fact that this former pond area was drained into 12 by running a hose out into this northwest corner -- 13 this pasture area -- it's quite likely that the hose 14 drained perc from the bottom of this pond area and 15 discharged it to the surface. That's an alternative 16 mechanism. Another mechanism is escape from the 17 bottom. Again, that's outside of my area of 18 expertise.</p> <p>19 BY MR. LYNCH:</p> <p>20 Q. That's what I wanted to clarify. That's not an 21 opinion you've addressed in your expert report?</p> <p>22 A. That's correct.</p> <p>23 Q. And I believe we testified earlier as to whether you 24 had an opinion as to whether any discharges or 25 releases from containment units did, in fact, occur</p> | <p>1 I believe, again, that's a very, very 2 unlikely scenario. That was the extent of my opinion. 3 That's what I have been asked to rebut.</p> <p>4 BY MR. LYNCH:</p> <p>5 Q. I understand that, Mr. Dale. I am not intending to -- 6 I just want to ascertain the limits of what you will 7 be opining at trial of this matter.</p> <p>8 A. Those are contained in my expert report.</p> <p>9 Q. Okay. So nothing that's not in your expert report 10 will be --</p> <p>11 A. I am not a hydrogeologist. I am not a pere 12 connotation migration -- pere contamination expert. 13 That's not my expertise and specifically it's not what 14 I was asked to do here, so no.</p> <p>15 Q. So am I correct that you do not have an expert opinion 16 as to what caused the contamination that's been found 17 in the northwest corner of the site?</p> <p>18 MR. DAVIS: That's a different question. 19 You asked him what he was asked to do. He may have an 20 opinion.</p> <p>21 BY MR. LYNCH:</p> <p>22 Q. Do you have an expert opinion as to what caused the 23 contamination in the northwest corner area of the 24 site?</p> <p>25 A. As an expert or as a technical person who understands</p> |

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|---|--|
| <p>1 these things? As an expert hired to address a</p> <p>2 particular set of issues or as a guy who has a brain</p> <p>3 and has been around this for ten years? Which is it?</p> <p>4 Q. We'll go with the expert first. Firstly as an expert.</p> <p>5 A. My expert report details my expert opinions.</p> <p>6 My technical expertise using my whole brain</p> <p>7 says that there was perc at the bottom of this pond</p> <p>8 area or wherever the pond area that they discharged</p> <p>9 perc. If you drop a hose into that and run the hose</p> <p>10 out to discharge it in the pasture up here that's</p> <p>11 where they got the perc. That's where you got a large</p> <p>12 surface area of perc. You had it in a hose. It</p> <p>13 didn't magically get 350 feet over land and drop in</p> <p>14 there.</p> <p>15 Q. What's the basis for your belief that water was</p> <p>16 discharged from --</p> <p>17 MR. GROSSBART: You know, he --</p> <p>18 BY MR. LYNCH:</p> <p>19 Q. -- the former pond area?</p> <p>20 A. There is deposition testimony to that effect.</p> <p>21 Q. Whose deposition testimony?</p> <p>22 A. We can find it if you want.</p> <p>23 Q. But it is not cited in your report, so that's why I'm</p> <p>24 wondering.</p> <p>25 MR. GROSSBART: He just told you that it's</p> | <p>1 MR. GROSSBART: Are you going to testify to</p> <p>2 that at trial in Montana?</p> <p>3 THE WITNESS: The court reporter may have a</p> <p>4 different opinion.</p> <p>5 BY MR. LYNCH:</p> <p>6 Q. If we look at Exhibit 2045, you see two other areas on</p> <p>7 that exhibit that are marked with green -- marked in</p> <p>8 green. Is that correct?</p> <p>9 A. Yes.</p> <p>10 Q. Do you have an understanding as to what those areas</p> <p>11 are?</p> <p>12 A. They are additional -- well, let's see. This is</p> <p>13 estimated extent of contaminated Vadose soil above</p> <p>14 remediation goals. Estimated extent of source area --</p> <p>15 geez, this is small print -- of source area saturated</p> <p>16 zone soil. There is surface contamination apparently.</p> <p>17 Q. Do you know whether Dr. Harris offered an opinion as</p> <p>18 to what the likely source of the contamination found</p> <p>19 in those areas was?</p> <p>20 MR. GROSSBART: Objection to the form of</p> <p>21 the question.</p> <p>22 A. I believe he indicated these were surface spills,</p> <p>23 loading and unloading. But I don't recall for sure.</p> <p>24 BY MR. LYNCH:</p> <p>25 Q. Do you dispute -- well, let's look at the report.</p> |
| Page 207 | Page 209 |
| <p>1 beyond what he's going to be testifying to. Then you</p> <p>2 say you want an answer in any event. He gives you the</p> <p>3 answer and then you complain that it's not in his</p> <p>4 report. You can't have it both ways.</p> <p>5 If you want to go fishing for his view, ask</p> <p>6 him who he thinks should, you know, run for senator,</p> <p>7 too. But that's not in the report. That's not what</p> <p>8 he will be testifying to. That's the problem with the</p> <p>9 questions.</p> <p>10 You can't ask for an off-the-cuff opinion</p> <p>11 and then impeach him with the fact that it's not in</p> <p>12 his report when he tells you that's not what he's here</p> <p>13 to testify about as an expert retained in this case as</p> <p>14 opposed to somebody who is an expert in the field and</p> <p>15 has a brain, as he said.</p> <p>16 That's just harassing the witness at this</p> <p>17 point.</p> <p>18 MR. LYNCH: Is that your objection?</p> <p>19 MR. GROSSBART: Yes, it is. Anything you</p> <p>20 didn't understand about it? Because I will repeat it</p> <p>21 if you want.</p> <p>22 MR. LYNCH: I'm sure you will.</p> <p>23 THE WITNESS: The senator, by the way,</p> <p>24 should be Keith Butler.</p> <p>25 MR. DAVIS: Who's Keith Butler?</p> | <p>1 MR. DAVIS: It's an exhibit.</p> <p>2 BY MR. LYNCH:</p> <p>3 Q. This one. Page five, opinion five on that states</p> <p>4 investigative data, deposition testimony, aerial</p> <p>5 photographs and other historical evidence indicate</p> <p>6 that contamination found in other areas of the Dyce</p> <p>7 site most likely arose from infrequent accidental</p> <p>8 releases and relatively small quantities of chemical</p> <p>9 product nearly all of which occurred in the 1970s or</p> <p>10 early 1980s.</p> <p>11 A. Yes. You read it correctly.</p> <p>12 Q. In your report have you taken issue with or rebutted</p> <p>13 that opinion expressed by Dr. Harris?</p> <p>14 MR. GROSSBART: Objection to the form of</p> <p>15 the question.</p> <p>16 A. No. My rebuttal is the single large spill of 250</p> <p>17 gallons or more, not the small quantities.</p> <p>18 BY MR. LYNCH:</p> <p>19 Q. In your report have you expressed any opinion as to</p> <p>20 how the contamination in these two other additional</p> <p>21 areas occurred?</p> <p>22 MR. GROSSBART: Asked and answered.</p> <p>23 MR. DAVIS: I will object as to foundation.</p> <p>24 He's just indicated he rebutted the 250-gallon spill.</p> <p>25 He hasn't addressed that. So how his report would</p> |

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|---|---|
| <p>1 address something it didn't address is --</p> <p>2 MR. LYNCH: Does his report --</p> <p>3 MR. GROSSBART: Asked and answered.</p> <p>4 A. No, it doesn't.</p> <p>5 BY MR. LYNCH:</p> <p>6 Q. Do you have any -- are you aware of any facts or</p> <p>7 evidence that would call into question the validity of</p> <p>8 the opinion expressed in part five of Dr. Harris's</p> <p>9 report that I just read?</p> <p>10 MR. GROSSBART: Objection to the form of</p> <p>11 the question.</p> <p>12 He just said that's beyond what his</p> <p>13 rebuttal is. It is an improper question to ask him</p> <p>14 that. It's beyond his expertise for purposes of this</p> <p>15 case.</p> <p>16 A. No. I didn't address that.</p> <p>17 BY MR. LYNCH:</p> <p>18 Q. Okay. And the reason I ask is because -- and the</p> <p>19 record will bear this out, but I believe you indicated</p> <p>20 earlier that that is one of the opinions you rebutted</p> <p>21 in your report. I just want to make sure it is not</p> <p>22 one of the opinions you rebutted in your report.</p> <p>23 MR. DAVIS: Paragraph five of page five of</p> <p>24 Harris's report?</p> <p>25 MR. LYNCH: Yes.</p> | <p>1 Q. I'm showing you 2019B, it looks to be the same</p> <p>2 document --</p> <p>3 MR. GROSSBART: Is that the same as this?</p> <p>4 MR. LYNCH: I believe it's from a different</p> <p>5 report.</p> <p>6 BY MR. LYNCH:</p> <p>7 Q. Figure 4.2 of Brenntag source area, soil remediation</p> <p>8 areas. It's -- looks like it was produced by Tetra</p> <p>9 Tech. I assume it was one of the exhibits to their</p> <p>10 investigative reports.</p> <p>11 MR. GROSSBART: They sure look alike.</p> <p>12 THE WITNESS: They do.</p> <p>13 BY MR. LYNCH:</p> <p>14 Q. This one Exhibit 2019 might be a little easier to</p> <p>15 read.</p> <p>16 Referring again to the source area closer</p> <p>17 to the warehouse, do you have an understanding as to</p> <p>18 when that area was paved with either asphalt or</p> <p>19 concrete?</p> <p>20 MR. GROSSBART: Asked and answered.</p> <p>21 A. I told you I don't know. That was my last answer to</p> <p>22 you.</p> <p>23 BY MR. LYNCH:</p> <p>24 Q. Given --</p> <p>25 A. I should say I don't recall.</p> |
| Page 211 | Page 213 |
| <p>1 BY MR. LYNCH:</p> <p>2 Q. The area -- the larger of the two green areas other</p> <p>3 than the hot spot area marked towards the -- what you</p> <p>4 believe is in --</p> <p>5 A. The warehouse?</p> <p>6 Q. -- the warehouse area of it, do you have an</p> <p>7 understanding as to what the surface of that area was?</p> <p>8 Was it paved, dirt? Was it --</p> <p>9 A. Well, when?</p> <p>10 Q. In 1975.</p> <p>11 A. I believe it was gravel at that point. At least part</p> <p>12 of it was gravel.</p> <p>13 Q. Do you know which part?</p> <p>14 A. I don't. Also part of -- the tanks were on concrete,</p> <p>15 but the area around the concrete I understand was</p> <p>16 gravel.</p> <p>17 Q. Do you know if or when that area was paved with either</p> <p>18 asphalt or concrete?</p> <p>19 A. I don't recall the dates.</p> <p>20 MR. LYNCH: Let me mark this 2019 Exhibit</p> <p>21 -- I'm sorry. 2019B.</p> <p>22 MARKED BY THE REPORTER:</p> <p>23 DEPOSITION EXHIBIT NUMBER 2019B</p> <p>24 -4:06 p.m.</p> <p>25 BY MR. LYNCH:</p> | <p>1 Q. Given your -- the opinion expressed in your report --</p> <p>2 given your opinion B expressed in your report that</p> <p>3 spills and leaks of perc on concrete or asphalt at</p> <p>4 Dyce Chemical are very unlikely to have permeated</p> <p>5 through to the soil -- strike that.</p> <p>6 Do you have an understanding as to whether</p> <p>7 that area that's designated in green -- the source</p> <p>8 area closest to the warehouse -- whether that area was</p> <p>9 ever paved with either asphalt or concrete?</p> <p>10 A. I don't recall.</p> <p>11 Q. You have opined that the alleged spill of 250 or more</p> <p>12 gallons of perc occurred on asphalt according to your</p> <p>13 testimony. Is that correct? Or in an area that was</p> <p>14 covered with asphalt. Is that correct?</p> <p>15 A. I don't believe the spill ever occurred. I have told</p> <p>16 you that again and again.</p> <p>17 Q. Well, no. There is an alleged large spill of 250</p> <p>18 gallons or more of perc on asphalt at the Dyce</p> <p>19 Chemical facility in about 1976 and is part B(c) of</p> <p>20 your report, correct?</p> <p>21 A. An alleged spill, yes.</p> <p>22 Q. Can you identify where using Exhibit 4.2 -- or I'm</p> <p>23 sorry -- Exhibit 2019B where that spill occurred?</p> <p>24 MR. DAVIS: Objection to the form of the</p> <p>25 question.</p> |

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|---|--|
| <p>1 Q. The first other purported cause identified by Dr. 2 Harris is other large spills and releases. 3 Do you have an opinion as to whether or not 4 any other large spills or releases occurred that 5 caused the contamination in the northwest corner? 6 MR. GROSSBART: Objection to the form of 7 the question. He's testified that he doesn't believe 8 any spills -- not any other ones, but any. 9 MR. DAVIS: Large. 10 MR. LYNCH: He just testified that he is 11 rebutting -- 12 MR. GROSSBART: Any large spills. 13 MR. LYNCH: He's rebutting this opinion 14 expressed by Dr. Harris. I want to find out which -- 15 MR. GROSSBART: The problem with number 16 four is that on page five it says -- after saying in 17 number two and number three that there was a 18 250-gallon spill he then says in number four -- he 19 kind of flips it around and approaches the same thing 20 from the other direction and says there is no other 21 explanation but for what I say in number two and 22 three. 23 So necessarily the witness is rebutting 24 four by virtue of the fact that he's rebutting two and 25 three. Definitionally that's the case.</p> | <p>1 northwest corner is polluted; that he's been retained 2 to say that however that may have happened it wasn't 3 because of the 250-gallon spill that Harris relies on. 4 THE WITNESS: That's correct. I'm not 5 sure. And I have not studied how that contamination 6 may have occurred. 7 BY MR. LYNCH: 8 Q. Okay. 9 A. That's not my assignment. 10 MR. LYNCH: I have no further questions. 11 MR. GROSSBART: Just a couple questions -- 12 THE WITNESS: Is the Brill question 13 withdrawn then? 14 MR. LYNCH: We'll withdraw the Brill 15 question. 16 MR. GROSSBART: For the record, to the 17 extent we have any time left in the seven hours we 18 reserve the right to hold the deposition open. 19 MR. DAVIS: We'll give you six or seven 20 minutes, Chris. 21 EXAMINATION 22 BY MR. DAVIS: 23 Q. Professor Dale, earlier -- much earlier this morning 24 in talking about one of your fundamental opinions 25 about the evaporative qualities of free-form perc you</p> |
| Page 219 | Page 221 |
| <p>1 That's the problem and, I think, the 2 confusing nature of your question. If you rebut two 3 and three you are definitionally rebutting four. 4 MR. LYNCH: I just want to clarify. 5 BY MR. LYNCH: 6 Q. On page 38 of Dr. Harris's opinion it refers to leaks, 7 overflows or discharges from the containment area. 8 On page 40 he refers to dumping of drums by 9 barrel reconditioners. I just want to clarify -- I 10 understand you are rebutting Harris's opinion number 11 four. 12 In so rebutting Harris's opinion number 13 four are you offering any opinion that any of these 14 events occurred or that they are, in fact, the source 15 -- probable source of the contamination found in the 16 northwest corner? 17 MR. GROSSBART: Objection to the form of 18 the question. 19 MR. DAVIS: Same objection. It's compound 20 and it's vague. You are referring to various pages of 21 testimony -- 22 MR. GROSSBART: He's already testified -- 23 MR. DAVIS: -- or report. 24 MR. GROSSBART: -- that he is not -- that 25 it's beyond his retention to pin down why the</p> | <p>1 had referenced relying upon deposition testimony from 2 a Mr. Cannon, a Mr. Agardy and I think you brought 3 some other depositions. 4 Let me ask you this: Apart from those 5 depositions, has the education that you have reviewed 6 with Mr. Lynch today and your work experience as a 7 professor of chemical engineering -- do those matters 8 in your background in your education and work 9 experience allow you without taking into account the 10 deposition testimony you have referenced today from 11 these other witnesses and other cases allow you to 12 opine about the evaporative qualities of free-form 13 perc? 14 A. Yes. 15 Q. All right. And does your education and training as a 16 professor of chemical engineering allow you to -- what 17 is your -- are your opinions any different? 18 A. No. I knew that perc evaporated very, very fast 19 before I ran the numbers and before I heard anybody's 20 deposition testimony. 21 Q. All right. You don't need their depositions to opine 22 as you have about how quickly perc evaporates? 23 A. No, I don't. 24 Q. All right. And then the same question I have about 25 the nature of the odor or what someone would notice</p> |

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|---|---|
| <p>1 CERTIFICATE OF NOTARY</p> <p>2 STATE OF MICHIGAN)</p> <p>3) SS</p> <p>4 COUNTY OF INGHAM)</p> <p>5</p> <p>6 I, Kelli L. Werner, a Notary Public in and</p> <p>7 for the above county and state, do hereby certify that</p> <p>8 the above deposition was taken before me at the time</p> <p>9 and place hereinbefore set forth; that the witness was</p> <p>10 by me first duly sworn to testify to the truth, and</p> <p>11 nothing but the truth; that the foregoing questions</p> <p>12 asked and answers made by the witness were duly</p> <p>13 recorded by me stenographically and reduced to</p> <p>14 computer transcription; that this is a true, full and</p> <p>15 correct transcript of my stenographic notes so taken;</p> <p>16 and that I am not related to, nor of counsel to either</p> <p>17 party nor interested in the event of this cause.</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22 Kelli L. Werner, CSR-6610, RPR</p> <p>23 Notary Public,</p> <p>24 Ingham County, Michigan</p> <p>25 My Commission expires: 02/01/2008</p> | <p>1 DEPOSITION EXHIBIT NUMBER 2044 167</p> <p>2 DEPOSITION EXHIBIT NUMBER 2045 180</p> <p>3 DEPOSITION EXHIBIT NUMBER 2046 182</p> <p>4 DEPOSITION EXHIBIT NUMBERS 2047-2048 185</p> <p>5 DEPOSITION EXHIBIT NUMBER 2049 195</p> <p>6 DEPOSITION EXHIBIT NUMBER 2019A 198</p> <p>7 DEPOSITION EXHIBIT NUMBER 2019B 211</p> <p>8</p> <p>9</p> <p>10</p> <p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p> |
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| <p>1 INDEX TO EXAMINATIONS</p> <p>2</p> <p>3 Witness Page</p> <p>4 BRUCE E. DALE, Ph.D.</p> <p>5</p> <p>6 EXAMINATION</p> <p>7 BY MR. LYNCH: 3</p> <p>8 EXAMINATION</p> <p>9 BY MR. DAVIS: 220</p> <p>10 EXAMINATION</p> <p>11 BY MR. GROSSBART: 222</p> <p>12</p> <p>13 INDEX TO EXHIBITS</p> <p>14</p> <p>15 Exhibit Page</p> <p>16 (Exhibits attached to transcript.)</p> <p>17</p> <p>18 DEPOSITION EXHIBIT NUMBER 2000 6</p> <p>19 DEPOSITION EXHIBIT NUMBERS 2001-2004 12</p> <p>20 DEPOSITION EXHIBIT NUMBER 2005 43</p> <p>21 DEPOSITION EXHIBIT NUMBERS 2006-2039 48</p> <p>22 DEPOSITION EXHIBIT NUMBER 2040 84</p> <p>23 DEPOSITION EXHIBIT NUMBER 2041 109</p> <p>24 DEPOSITION EXHIBIT NUMBER 2042 114</p> <p>25 DEPOSITION EXHIBIT NUMBER 2043 131</p> | |

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